

The feathered ranunculus *Polymixis lichenea* (Hübner) Lepidoptera: Noctuidae, in the west of Scotland

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INTRODUCTION

The feathered ranunculus *Polymixis lichenea* (Hübner) is a fairly large grey-green noctuid moth. The male has feathered antennae which readily distinguish it from males of other British *Polymixis* species and from the small ranunculus *Hecatera dysodea* and grey chi *Antitype chi*. It is one of a small number of species that Leverton (2001) describes as 'unappreciated moths', not particularly noteworthy in Britain as a whole but more significant due to its restricted distribution in Europe where it is found primarily in coastal areas from Denmark in the north to the Iberian peninsula in the south, and also in the western Mediterranean including Italy and the islands of Corsica, Sardinia and Sicily (Karsholt & Razowski, 1996). Skou (1991) uses this species to exemplify a classic 'atlanto-mediterranean' distribution. In Scotland, it can reasonably be described as scarce.

Summarising Waring and Townsend's (2003) distributional notes for Britain, *P.lichenea* is thought to be well distributed along the western coasts of Britain from the Isle of Wight to the Isle of Man and south-west Scotland; more locally on the eastern coasts of England north to Yorkshire; locally on the coasts of Ireland; locally inland as far north as Derbyshire, Cheshire and North Wales. Although *P.lichenea* has a predominantly coastal distribution in Britain, larval food-plants are not confined to coastal habitats. They include biting stonecrop *Sedum acre*, thrift *Armeria maritima*, red valerian *Centranthus ruber*, hounds tongue *Cynoglossum officinale*, plantains *Plantago* spp., speedwell *Veronica* spp., garlic *Allium* spp., and nettles *Urtica* spp. (Heath & Emmett, 1983).

Motivated by recent records from two sites on the Isle of Bute, which is further north than most known locations, we review what is known about the species' occurrence in the west of Scotland. In compiling this review, we consulted standard works on British moths and the Scottish Insect Reference Index (SIRI) held at the National Museum of Scotland. The Hunterian Museum, Glasgow Museums, and the National Museum of Scotland provided information on known specimens of Scottish provenance in their collections. The one such specimen is with Glasgow Museums and is from Vice County 75 (VC75), Ayrshire (see below). It is possible that there are other specimens in non-curated or in-store parts of the museums' collections.

We also consulted Vice County recorders in appropriate areas of the west of Scotland, the Rothamsted Insect Survey (RIS), the Dumfries and Galloway Environmental Resources Centre (DGERC) and other organisations and individuals and who were likely to have or know of records. We extended our consultation to cover areas of Northern Ireland at latitudes comparable to southern Scotland. Where appropriate, some records were checked with the Biological Records Centre, Wallingford (BRC).

RESULTS

Many of the Scottish records we refer to are from light traps, and thus may include adults which have dispersed from elsewhere into the trapping area. One record (Christie, 1987; see below under VC75) is known to be a larva. Among the records, *P. lichenea* is referred to by various former generic names: *Epunda*, *Eumichtis* and *Polia*. The subspecies *P. lichenea lichenea* is thought to predominate in Britain but none of the records available are given to subspecific level. Among the records, only Jackson (1910) and Gordon (1913) mention a particular colour form; both referred to var. *viridicincta* in relation to their records from the Mull of Galloway (see below under VC74).

VC72 Dumfriesshire

Duncan and Cunningham (1952,1953) mention a 1951 record from Tynron, which is inland within hectad NX89; the former paper makes clear that the record is attributable to Duncan, 2 individuals on 01/09/1951. There is one unpublished record from DGERC: Kirkton, NX972821, 97+ individuals caught during 1997, col R.& B.Mearns, det R.Mearns.

VC73 Kirkcudbrightshire

Two of the Scottish records indicated on Heath and Emmett's map are in Kirkcudbrightshire; NX65 and NX75. These records could not be traced at BRC but they probably refer to records from two traps operated by RIS: Bridge of Dee, NX730590, 22/09/1976, 1 individual; Gatehouse of Fleet, NX602553, 15/09/1974, 1 individual. There is an additional record from a RIS trap at Mabie, NX951707, 18-21/09/1989, 1 individual.

There are also unpublished records from DGERC: Needles Eye, Torrs Heughs, NX887545, 15/09/2003, 6 individuals, col R.& B.Mearns, det R.Mearns; Portling

Bay, NX8854, 1999, 13 individuals, col R.& B.Mearns, det R.Mearns; Rough Island, NX8453, 1994, 1 individual, col, det R.Mearns; Meikle Ross, NX6543, 23/09/2006, 36 individuals, col R.& B.Mearns, det R.Mearns; Cally Woods, NX598547, 1999, 1 individual, col, det P.Norman.

VC74 Wigtownshire

Jackson (1910) found *P.lichenea* among moths sent to her in 1910 from the Mull of Galloway by the lighthouse keeper there. Jackson's record is also mentioned by Gordon (1913), but with the erroneous date of 1909; Gordon adds a 1909 record of his own from the same location. DGERC holds a recent unpublished record from the Mull of Galloway, NX1530, 18-19/09/1998, 5 individuals, col, det anon. Also from DGERC: Castle Feather, Burrow Head, NX447342, 28/09/2003, 16 individuals, col R.&B.Mearns, det R.Mearns; Garheugh Cliffs, NX267503, 25/09/2000, 1 individual, col R.&B.Mearns, det K.Bland (male, genitalia checked).

VC75 Ayrshire

South (1907) mentions records for *P.lichenea* from Renfrew and Ayr. It seems likely that he was referring to records that appeared in a compilation for the Clyde area by Dalgleish (1901). Dalgleish's Ayr record reads 'nr Adamton and Fullerton, Ayrshire (JP Duncan)'. No date is provided but the area between Adamton House, Adamton Mains and Fullerton House is almost all in hectad NS32. It is possible that this record corresponds to a specimen of *P.lichenea* currently in the collection at Glasgow Museums. It was within a collection bequested to the Museum by Col. Robert J. Bennett (b 1843, d 1916), a former treasurer of the Glasgow Natural History Society. The specimen is clearly labelled Ayrshire, but with no date or additional information.

Further south, on the coast, there are records from the RIS trap at Culzean Castle, NS235095, 9 individuals among six different years between 1975 and 1992. Christie (1987) found a larva on garlic on 19/05/86 at Bennane Head, Ballantrae, NX0986; it was successfully reared on garlic, pupating on 31/05/1986 and emerging on 07/09/1986. Inland, there is a record from the RIS trap at Darvel, NS598365, 14/09/1998, 1 individual.

VC76 Renfrewshire

Dalgleish's (1901) Renfrew record reads 'Very rare; one very dark sp. Barrochan Moss, Renfrewshire (1895), (John Dunsmore)'. It is clear that this is the same record as listed by Stewart (1915) and Dunsmore is credited with personal involvement in the preparation the latter list. Unlike Dalgleish, Stewart spells the location Barochan (one 'r') as it appears on present day maps. The location is in hectad NS46.

VC84 West Lothian

The distribution map in Heath and Emmett (1983) indicates a post-1960 record from hectad NT17, west of Edinburgh. This record is believed to derive from a

record card held by BRC. The card is headed 'Additions' and records seven species including *P.lichenea*. The location is given as 'Winchburgh, Kirkliston and Dalmeny' and VC84 West Lothian, the date is simply 1976 and the grid reference is 36/1- -7- - (an alternative form of NT17). Interestingly, in the E.C.Pelham-Clinton index in the National Museum of Scotland there is a record of a single individual trapped in his garden at NT099759, Gillerhill (near Winchburgh) on 07/10/1976, and Pelham-Clinton's property extended from NT07 into NT17 (Greg Fitchett, personal communication). Pelham-Clinton would have been careful to provide an accurate grid reference for the location of the moth trap within his garden, but others may not have been aware of the trap's precise location. Therefore, it seems probable that this is the same record as the BRC card and that the record should be from hectad NT07 not NT17. However, in our map (Fig. 1) we have followed Heath and Emmett in plotting it as NT17 to avoid the possibility of a less than careful reader concluding that there are records from two different hectads.

VC98 Argyll (Main)

Christie (1891) reported catching 15 individuals at sugar on 11/09/1891 and more on 13/09/1891 along a road on the shores of Loch Riddon, a location that is almost certainly in hectad NS07.

VC100 Clyde Isles

Not far south of the Loch Riddon location, single individuals of *E.lichenea* have come to light at two sites on the Isle of Bute: on 14/09/2008 in a garden in an open mixed-species woodland environment adjacent to grassland at Ascog, NS104639, and on 24/09/2008 in birch-dominated woodland at Kingarth, NS091552 adjacent to improved grassland, both records col D.&G.Collis, det R.Leverton. On Arran, the RIS trap at Brodick Castle, NS014380, caught 4 individuals among three different years between 1992 and 1999. There is also a recent record in a garden at Dippin in the south of Arran, NS040219, 26/09/2008, 1 individual, col J.Baines, det R.Leverton.

VC101 Kintyre

Skinner (1998) mentions Kintyre as in the range of *P.lichenea*, but we have not been able to trace a more specific location.

Northern Ireland: VCH38 Down and VCH39 Antrim

Skinner (1988) mentioned various localities in Ireland, the most northerly being Down. Records kindly made available by the Northern Ireland branch of Butterfly Conservation confirm that the Newcastle/Castlewellan area of County Down is something of a hotspot for *P.lichenea*; this area is about the same latitude as the Isle of Man. In addition, there are two more northerly records which provide a particularly interesting perspective on the distribution in the west of Scotland. One record is from Copeland Island Bird Observatory, which is on Lighthouse Island at the east end of Belfast Lough, J597859, 24/09/2004, 1 individual, col, det

K.Leonard. This site is about the same latitude as the Mull of Galloway and Burrows Point in Dumfries & Galloway. Further north, at the west end of Rathlin Island, D092517, 25/08/2001, 1 individual, col, det M.Hughes. Rathlin Island is about the same latitude as Culzean Castle in Ayrshire, but much more exposed to Atlantic weather.



Fig. 1. The geographical distribution of records of the feathered ranunculus *Polymixis lichenea* mentioned in the text. Open circles represent 10km squares with records prior to 1980, filled circles represent later records. Note that the true location of the record in hectad NT17 might be NT07 (see text). Map produced by MapMate© using Digital Map Data © Bartholomew 2008. Data Overlay Copyright © Glasgow Natural History Society and the authors.

DISCUSSION

To summarise the distribution of *P.lichenea* in the west of Scotland (Fig. 1), there is a wide scattering of records across Dumfries & Galloway (VCs 72, 73 and 74) but it is unclear whether the relatively high density of records in this area truly reflects a stronghold of the species or simply more recording activity. The most recent record that we are aware of from that area is 2006. To date, there are many fewer sites yielding recent records in Ayrshire, VC75, one of which is a century-old record. There are also single century-old records in each of Renfrew VC76 and Argyll (Main) VC98. In the Clyde Isles VC100, Arran has yielded recent records at two sites, and the species has appeared at two sites in Bute in only the second year of light trapping there.

Fig. 2 summarises the distribution of dates of capture of adults across the annual cycle for the 31 instances where we have full dates. Multiple individuals taken on the same date at the same site are regarded as a single data point. The earliest capture was on 21st August, and the latest on 7th October. The median date was 19th September. Data from two RIS traps demonstrate that, over several years, individual sites can have a wide range of capture dates: Brodick Castle 21st August to 8th October; Culzean Castle 28th August to 7th October.

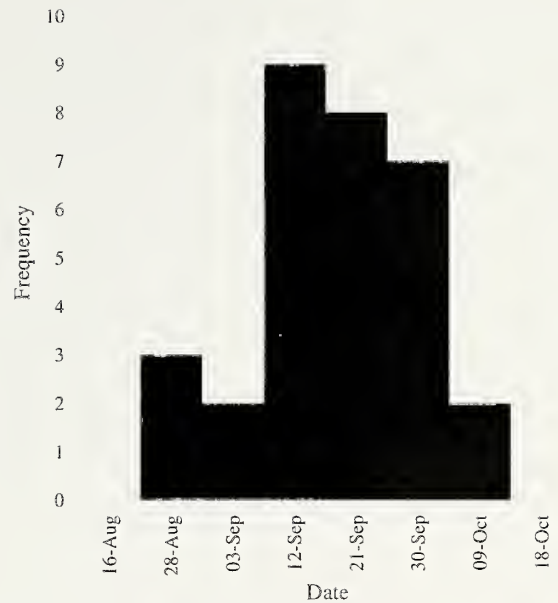


Fig. 2. Seasonal distribution of Scottish records of the feathered ranunculus *Polymixis lichenea*. Each bar represents a 9 day interval.

What can be said about the scarcity of *P.lichenea* in the west of Scotland? The relatively systematic nature of the RIS trapping programme provides an opportunity to examine the frequency of records with a firmer basis than is typically possible. The period when the various traps were in operation is as follows: Bridge of Dee 1975 to 1977; Gatehouse of Fleet 1974 to 1980; Mabie 1985 to 1992; Culzean Castle 1976 to present; Darvel 1996 to 1998; Brodick Castle 1984 to present. To avoid bias, an additional trap in the area should also be considered: Auchincruive 1968 to present. Auchincruive provided no records of *P.lichenea*, but to omit it from consideration could inflate estimates of frequency. On the other hand this site is somewhat atypical as catches are relatively small in number and the surrounding area is dominated by intensive grassland. Using data from the seven RIS traps up to and including 2006 (at the time of writing subsequent data is incomplete) we calculate an estimate of 17 individuals in 114 trap-years or 1 individual in every 6.7 trap-years (about 1 individual in 4.4 trap-years if we omit Auchincruive). These estimates should be lower than trap rates where site selection was optimised for *P.lichenea*. It should also be noted that RIS traps use 200 watt tungsten bulbs and so catch smaller numbers of moths in general than traps with mercury vapour bulbs.

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